THE IMPACT OF EXECUTIVE COMPENSATION AND AUDIT QUALITY ON ACCRUAL-BASED AND REAL-BASED EARNINGS MANAGEMENT: EVIDENCE FROM JORDAN

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Abstract

This study investigates the relationship between executive compensation, audit quality, and accrual and real earnings management in Jordan. While prior literature focuses on examining the impact of audit quality on accrual earnings management in Jordan, this study contributes to the literature by investigating the impact of executive compensation on real earnings management activities in Jordan. Further, this study contributes to the literature by investigating the impact of audit quality on real earnings management. By examining a Jordanian sample of 445 firm-year observations over the period from 2000 to 2011, this study presents new evidence that executive compensation is positively associated with accrual earnings management, suggesting that managers engage in accrual earnings management to increase reported earnings and, therefore, increase their pay-performance compensation. Further, the results show that managers who engaged in a higher level of real earnings management (via sales-based manipulation) received a lower level of compensation, suggesting that managers in Jordan are punished for the use of real activities. In terms of audit quality, the results show no evidence that audit quality is associated with accrual and real earnings management in Jordan. This study uses the corrected model of Jones (1991) as suggested by Dechow et al. (1995) is to estimate normal accruals, while the models of Roychowdhury (2006) are used to estimate real earnings management activities.

Keywords: Executive Compensation, Audit Quality, Accrual and Real Earnings Management, Jordan

1. INTRODUCTION

The aim of this paper is to examine the relationship between executive compensation, audit quality, and accrual and real earnings management in Jordan. Recent research has shown increased interest in exploring earnings management practices by Jordanian public firms (e.g. Abed at al., 2012; Hamdan et al., 2013; Abu Jebril and Al.Thuneibat, 2016; Alzoubi, 2016; Alqatamin et al., 2017; Al-Shar' and Dongfang, 2017; Ibrahim and Al Awawdeh, 2017). However, to date, there has been very limited research that has examined whether executive compensation and audit quality are associated with earnings management practices. Further, while prior research has mainly focused on accrual earnings management, this study has extended the literature to examine real earnings management activities that undertaken by Jordanian public firms.

The agency theory pointed that due to some agency conflicts the managers may engage in several activities to increase their personal wealth, but at the expense of shareholders' wealth (Jensen and Meckling, 1976). In an attempt to prevent such conflicts, the executive compensation plan was one of the main solutions that presented to align between the interest of managers and shareholders (Watts and Zimmerman, 1986). However, prior research has found evidence that executive compensation has led to opposite outcomes. In particular, prior research has found evidence that managers engage in earnings management activities to meet their compensation targets and, therefore, increasing their wealth at the expense of shareholders (Cheng, 2004; Cheng and Warfield, 2005; Bergstresser and Philippon, 2006).

One of the widely accepted definitions of earnings management is presented by Schipper (1989, p. 92) as follows "*purposeful intervention in the external financial reporting process, with the intent of obtaining some private gain*". Earnings management can be conducted via several techniques e.g. discretionary accruals, real activities, and classification shifting that overall lead to manipulate reported income to meet several incentives e.g. meeting income targets (Burgstahler and Dichev, 1997; Degeorge et al., 1999; Osma, 2008), increasing the offer prices during the Initial Public Offering and Seasoned Equity Offering (Rangan, 1998; Teoh et al., 1998; Alhadab, 2015), meeting the requirements of debt contracts (Sweeney, 1994; Jaggi and Picheng, 2002).

Given the fact that managers would engage in earnings management activities to manage reported earnings to meet several incentives, prior research has investigated how such practices of earnings management would affect the firms' future operating and stock return performance. As expected, prior research has found evidence that earnings management activities are negatively associated with future performance. In particular, firms that engage in a higher level of real and accrual earnings management are found to experience poor operating and stock return performance in the following periods. A recent study by Alhadab et al. (2015) has found UK IPO firms which engaged in a higher level of real and accrual earnings management experienced a higher probability of failure in the subsequent years. Other studies by Rangan (1998) and Cohen and Zarowin (2010) have found evidence that Seasoned Equity Offering (SEO) firms in the US experience very poor operating performance in the subsequent years due to earnings management practices that were undertaken during the offering year. Aladab and Al-Own (2017) in the meanwhile have found evidence that European banks which engaged in a higher level of earnings management via discretionary loan loss provision experienced inferior operating performance in the following periods. Thus, earnings management practices not just destroy the firms' value, but also extend their effect to negatively impact both shareholders' and stakeholders' wealth.

On the other side, the litigation theory expects that high-quality audit firms would play an effective monitoring role to prevent the use of earnings management to avoid any potential litigation risks and to protect their reputation (Francis and Krishnan, 1999; Khurana and Raman, 2004). For example, investors who incurred losses due to earnings management practices would for sure try to recover part of the losses by suing the firm's auditor. Consistent with the litigation hypothesis, prior research has found evidence that the presence of high-quality audit firms (*BIG4*) is associated with less level of earnings management activities e.g. discretionary accruals. (Balsam et al., 2003; Elder and Zhou, 2002; Chen et al., 2005; Chi et al., 2011; Alhadab, 2016b).

By examining a Jordanian sample that consists of 445 firm-year observations over the period from 2000 to 2011, this study provides the following evidence. First, it shows that public firms in Jordan do engage in accrual and real earnings management to increase reported earnings. Prior research has focused on examining accrual earnings management, while the findings of this study contribute to the literature by showing that real activities are widely used by Jordanian public firms to manage reported earnings. Second, this study provides the first evidence based on a Jordanian sample that executive compensation leads to increase the use of accrual earnings management. In particular, the findings of this study suggest that managers engage in accruals earnings management to increase reported earnings to meet their compensation targets (pay-performance compensation).

Third, this study presents new evidence to the literature that managers of public firms in Jordan are punished for using real earnings management. Specifically, the findings of this study show that executive compensation is positively associated with abnormal cash flows from operations (sales-based manipulation) and the aggregated measure of real earnings management. Finally, this study presents evidence that audit quality is not associated with accrual and real earnings management in Jordan. These results may be attributed to the fact that just 11 percent of the total sample firms of this study are audited by high-quality audit firms and, therefore, the empirical analysis does not fully address the effect of high-quality audit firms.

The structure of the study is as follows. Section 2 provides the literature review and hypotheses development. Section 3 presents sample construction, variables measurement, and empirical models. Section 4 presents descriptive statistics, correlation matrix, and empirical results. Section 5 presents the conclusions.

2. LITERATURE REVIEW

2.1. Executive compensation and accrual and real earnings management

As discussed before the agency theory provides the theoretical framework to explain how executive compensation can lead managers to engage in earnings management. Watts and Zimmerman (1986) indicate that executive compensation is presented as a solution to solve the conflict between managers and shareholders. In particular, the pay-performance compensation was structured in such way that can align with the interest of agent and principal to

maximize the firms' value.

However, prior research has found evidence that managers engage in earnings management to meet their performance-target compensation when they are unable to do so using the normal business practices. Cheng and Warfield (2005) have found evidence that the equity incentives of Chief Executive Officers (CEOs) in the US are positively associated with accrual earnings management, suggesting that executives manage reported earnings to meet their equity incentives' targets. Dechow and Sloan (1991) have examined whether executive compensation is associated with real earnings management activities. They have found evidence that executives, who about to retire, cut the research and development expenses to increase reported earnings to meet compensation targets.

Baker et al. (2003) have examined different components of equity incentives and found a positive association between executives' stock options and the level of discretionary accruals. Shuto (2007) has examined the association between equity incentive and earnings management using a Japanese sample and found similar evidence to prior research. In particular, Shuto (2007) has found evidence that executives receive a higher level of compensation when their firms engage in a higher level of discretionary accruals, suggesting that the use of income-increasing earnings management leads to a higher level of compensation.

Despite this extensive research on the relationship between earnings management and executive compensation, no research to date has examined this relationship using a Jordanian sample. Recent studies have found evidence that Jordanian public firms do engage in earnings management practices to manipulate reported earnings (e.g. Abed at al., 2012; Hamdan et al., 2013; Alzoubi, 2016; Alqatamin et al., 2017; Ibrahim and Al Awawdeh, 2017). Thus, it would be of great interest to abroad audience in Jordan (e.g., investors, lenders, etc.) to examine whether executive compensation can work as a strong incentive to manage reported earnings. This study, therefore, focuses on two techniques of earnings management that are widely used to manipulate reported earnings, namely accrual earnings management, and real activities. Hence, the first hypothesis of this study is as follows:

H1: A higher level of executive compensation is positively associated with a higher level of accrual and/or real earnings management.

2.2. Audit quality and accrual and real earnings management

The second main objective of this study is to examine the association between audit quality and accrual and real earnings management in Jordan. The litigation risk hypothesis indicates that high-quality audit firms are more concerned about any future litigation risk and therefore they effectively monitor and detect any earnings management practices undertaken by their clients (Francis and Krishnan, 1999; Khurana and Raman, 2004). Consistent with the litigation hypothesis, prior research has found evidence that high quality auditing (measured using different proxies e.g. Big N auditors, audit fees, industry specialists, etc.) leads to a lower level of accrual earnings management (DeAngelo, 1981; Becker et al., 1998; Francis and Krishnan, 1999; Frankel et al., 2002; Krishnan, 2003; Antle et al., 2006; Caramanis and Lennox, 2008). For example, Becker et al. (1998) and Frankel et al. (2002) have examined the relationship between audit quality and accrual earnings management using US samples. They have found evidence that firms audited by high-quality auditors exhibit a lower level of discretionary accruals. These results are based on a developed context and suggest that high-quality audit firms play an effective role to prevent earnings manipulation.

Further, recent studies have examined the association between audit quality and accrual earnings management using samples from developing economies (e.g., Jordan, Saudi Arabia) and found similar evidence. For example, Alzoubi (2016) has examined the effect of enhanced audit quality on accrual earnings management using a Jordanian sample of 86 public firms over the period from 2007 to 2010. Alzoubi (2016) has found evidence that the presence of high-quality audit firms is negatively associated with the level of discretionary accruals. Habbash and Alghamdi (2017) in the meanwhile have examined the relationship between audit quality and discretionary accruals using a sample from Saudi Arabia. They have found evidence that auditor opinion is associated with the absolute value of discretionary accruals.

While the focus of prior research on the impact of audit quality on accrual earnings management, recent research has shown evidence that audit quality can impact as well the use of real earnings management. In particular, Cohen and Zarwoin (2010) and Chi et al. (2011) have found evidence that firms with strong incentives to manage reported earnings may switch to use more real earnings management when their auditors (*BIG4*) monitor the use of accrual earnings management. Thus, this study contributes to the literature by not just examining the relationship between audit quality and accrual earnings management in Jordan, but also extending the scope of the analysis to cover real earnings management, a research area that has not received much attention by prior researchers in Jordan. Hence, the second hypothesis of this study is therefore as follows:

H2: An enhanced audit quality is negatively (positively) associated with accrual (real) earnings management.

3. RESEARCH METHOD

3.1. Study population and sample

The sample of this study consists of all Jordanian public firms that listed on the Amman Stock Exchange over the period from 2000 to 2011. Data related to the main variables are collected from the Amman Stock Exchange (ASE) website e.g. total assets, sales, net income, etc. The ASE provides excel sheets that summarize all information included in the financial statements. Thus, any missing data are manually collected from the annual reports of the public firms. Data concerning audit quality are not

provided by the ASE website and, therefore, they are manually collected from the annual reports of the public firms. Further, and given the fact that the credit crisis has a major impact on the capital markets, the sample period starts in 2000 and ends in 2011 to ensure that it covers the years pre and post crisis-period. Following Alhadab and Tahat (2016), the range of the crisis-period is from 2007 to 2009. Further, as a requirement to estimate real and accrual earnings management, any industry-year group with less than six observations are excluded from the sample (Rosner, 2003; Athanasakou et al., 2009; Alhadab, 2015; Alhadab, 2017). Given all above restrictions on the sample construction, the final sample of this study consists of 445 firm-year observations over the sample period from 2000 to 2011.

3.2. Measurement of variables

This study focuses on two main techniques that are widely used to manage reported earnings that are discretionary accruals and real activities. Another technique to manage income is classification shifting, but this technique is outside the scope of study since it requires major transactions like merger and acquisition.

3.2.1. Accrual earnings management

Following prior research (e.g., Alhadab et al., 2015; Alhadab, 2017), discretionary accruals are used as the main proxy for accrual earnings management. Discretionary accruals are therefore calculated as the residual from cross-sectional OLS regression that is used to estimate normal accruals. Actual total accruals are defined as earnings before extraordinary items minus operating cash flows, while the corrected model of Jones (1991) as suggested by Dechow et al. (1995) is used to estimate normal accruals. Hence, the following cross-sectional OLS regression is used to estimate normal accruals for the sample for each industry-year category that has at least six observations (Rosner, 2003; Athanasakou et al., 2009; Alhadab et al., 2015).

$$\frac{TA_{i,t}}{ASSETS_{i,t-1}} = a_0 + \beta_1 \frac{1}{ASSETS_{i,t-1}} + \beta_2 \frac{\Delta SALES_{i,t}}{ASSETS_{i,t-1}} + \beta_3 \frac{PPE_{i,t}}{ASSETS_{i,t-1}} + \varepsilon_{DA-Jones} \quad (1)$$

where, *TA* represents total accruals that are calculated as earnings before extraordinary items minus cash flows from operations; $ASSETS_{t-1}$ represents the beginning balance of total assets during a year; $\Delta SALES$ represents the change in sales during a year, and *PPE* represents the gross property, plant, and equipment. To avoid the effect of Heteroscedasticity all variables are scaled by the beginning balance of total assets. The residual ($\varepsilon_{DA\text{-}Jones}$) from equation (1) above represents discretionary accruals (*DA-Jones*) that are estimated using the corrected version of Jones (1991) model.

For robustness, this study also re-estimate discretionary accruals using the piecewise linear variant of Ball and Shivakumar (2008) model. Thus, the following cross-sectional OLS regression is used to estimate normal accruals for the sample for each industry-year category that has at least six observations (Rosner, 2003; Athanasakou et al., 2009; Alhadab et al., 2015).

$$\frac{TA_{i,t}}{ASSETS_{i,t-1}} = a_0 + \beta_1 \frac{\Delta SALES_{I,t}}{ASSETS_{i,t-1}} + \beta_3 \frac{CFO_{i,t}}{ASSETS_{i,t-1}} + \beta_4 DCF + \beta_5 \left[\frac{CFO_{i,t}}{ASSETS_{i,t-1}} * DCF\right] + \varepsilon_{DA-Ball} \quad (2)$$

where, $CFO_{i,t}$ represents operating cash flows, $DCFO_{i,t}$ represents an indicator variable equals 1 if a firm reports negative cash flows from operations and zero otherwise. The residual ($\varepsilon_{DA\text{-}Ball}$) from equation (2) above represents discretionary accruals (*DA-Ball*) that are estimated using the Ball and Shivakumar (2008) model.

3.2.2. Real earnings management

This study examines two widely used activities of real earnings management that are sales-based manipulation and discretionary expenses-based manipulation. (Production cost-based manipulation is not examined by this study since this activity is just used by manufacturing firms Roychowdhury, 2006 which represent very low percentage of the total sample firms). As discussed by Roychowdhury (2006), the first activity is sales-based manipulation that measured by the abnormal level of cash flows from operations (*ABCF*), and can be conducted via offering price discounts or more lenient credit terms. This activity leads to increase the current sales and, therefore, net income. While the second activity is discretionary expenses-based manipulation that conducted by cutting discretionary expenses in the current period to increase the net income e.g., reducing selling, research and development, and advertising expenses. The abnormal level of discretionary expenses (*ABDX*) is used as a proxy of discretionary expenses-based manipulation.

Similar to the estimation of discretionary accruals, the normal levels of cash flows from operations and discretionary expenses are estimated using models developed by Roychowdhury (2006). Then, the abnormal levels of cash flows from operations and the abnormal level of discretionary expenses are calculated as the residuals from Roychowdhury (2006) models. Hence, the following cross-sectional OLS regressions are used to estimate the normal level of cash flows from operation and discretionary expenses for the sample for each industry-year category that has at least six observations (Rosner, 2003; Athanasakou et al., 2009; Alhadab et al., 2015).

$$\frac{CFO_{i,t}}{ASSETS_{i,t-1}} = a_0 + \beta_1 \frac{1}{ASSETS_{i,t-1}} + \beta_2 \frac{SALES_{i,t}}{ASSETS_{i,t-1}} + \beta_3 \frac{\Delta SALES_{i,t}}{ASSETS_{i,t-1}} + \varepsilon_{ABCF} \quad (3)$$

$$\frac{DISX_{i,t}}{ASSETS_{i,t-1}} = a_0 + \beta_1 \frac{1}{ASSETS_{i,t-1}} + \beta_2 \frac{SALES_{i,t-1}}{ASSETS_{i,t-1}} + \varepsilon_{ABDX} \quad (4)$$

where $CFO_{i,t}$ represents operating cash flows, $SALES_{i,t}$ represents sales during a year, and $SALES_{i,t-1}$ represent the beginning balance of sales during a year, $DISX_{i,t}$ represents the sum of research and development expenses, selling, general and administrative expense, and advertising expenses during a year . The residual (ε_{ABCF}) from equation (3) above represents abnormal cash flows from operations (*ABCF*). The residual (ε_{ABDX}) from equation (4) above represents abnormal discretionary expenses (*ABDX*). To have consistent interpretation concerning income-increasing both abnormal cash flows from operations (*ABCF*) and abnormal discretionary expenses (*ABDX*) are multiplied by minus one. Further, and consistent with prior research (Chi et al., 2011; Alhadab, 2016b), this study constructs an aggregated measure of real earnings management that equals to the sum of the abnormal level of cash flows from operations (*ABCF*) and abnormal level of discretionary expenses (*ABDX*). The aggregated measure of real earnings management is constructed to explore the overall impact of real activities.

3.3. Empirical models

To explore the relationship between executive compensation, audit quality, and accrual and real earnings management, this study uses the following two empirical models where the dependent variable (*EM*) is a proxy of discretionary accruals (*DA-Jones* and *DA-Ball*), abnormal cash flows from operation (*ABCF*), abnormal discretionary expenses (*ABDX*), and the aggregated measure of real earnings management (*REM*). The first model (equation 5) is estimated to examine the relationship between executive compensation and accrual and real earnings management, while the second model (equation 6) is estimated to examine the impact of audit quality on the use of accrual and real earnings management. The models are as follows:

$$EM_{i,t} = a_0 + \beta_1 EXCOM_{it} + \beta_2 SIZE_{it} + \beta_3 ROA_{it} + \beta_4 LOSS_{it} + \beta_5 LEV_{it} + \beta_6 BM_{it} + \beta_7 CPEX_{it} + \beta_8 BV_{it} + IND + Year + \varepsilon_{it} \quad (5)$$

$$EM_{i,t} = a_0 + \beta_1 BIG4_{it} + \beta_2 SIZE_{it} + \beta_3 ROA_{it} + \beta_4 LOSS_{it} + \beta_5 LEV_{it} + \beta_6 BM_{it} + \beta_7 CPEX_{it} + \beta_8 BV_{it} + IND + Year + \varepsilon_{it} \quad (6)$$

where (*EM*) as explained above is a proxy for accrual and real earnings management, (*EXCOM*) is a proxy for executive compensation that is calculated as the sum of executives' salaries and any other compensations that are reported in the firms' annual reports, (*BIG4*) is a proxy of audit quality that is defined as a dummy variable equals one if the audit firm is one of big four audit firms, and zero otherwise. This definition of high-quality audit firms is widely used by prior research (e.g., Zang, 2012; Alhadab, 2016a).

Following prior research (Becker et al., 1998; Francis and Krishnan, 1999; Frankel et al., 2002; Baker et al., 2003; Krishnan, 2003; Cheng and Warfield, 2005; Antle et al., 2006; Shuto, 2007; Caramanis and Lennox, 2008; Alhadab, 2016b), the models include a number of determinant variables that are found to impact the use of accrual and real earnings management, as follows. The natural logarithm of total assets (*SIZE*) is added to control for the effect of firm size. Prior research has found mixed evidence on the association between size and earnings management. On the one hand, managers of large firms may engage in a higher level of earnings management since their firms have many and very complex transactions (Jensen and Meckling, 1976; Alhadab 2016b). On the other hand, managers of large firms may find it hard to engage in earnings management due to the effective monitoring by analysts, institutional investors, and audit firms (Meek et al. 2007). Thus, firm size may negatively or positively associate with accrual and earnings management.

To control for profitability, return on assets (*ROA*) and loss dummy (*LOSS*) are added into the model, where (*LOSS*) represents a dummy variable equals one if a firm reports loss and zero otherwise. Managers may engage in real and accrual earnings to increase reported earnings when they are unable to do so through business normal practices (Roychowdhury, 2006). While leverage ratio (*LEV*) is added to control for the level of debt since managers may engage in more (less) earnings management to avoid missing the debt covenant performance-targets (restructure the current debt covenants) (e.g., DeFond and Jiambalvo, 1994; Jaggi and Picheng, 2002)

In terms of growth opportunities, the models include capital expenditure (*CPEX*), the book value of equity (*BV*), and book to the market ratio (*BM*) that is calculated as the book value of equity divided by market value of equity. Prior research has found mixed evidence on the impact of growth characteristics on earnings management due to the measurement errors that associated with estimating earnings management proxies (Dechow et al., 1995; Alhadab, 2017). Thus, no prediction is made on the sign of coefficients for these growth determinants. Finally, the models consider the effect of time and industry by adding (*IND*) and (*Year*). Table 1 presents definitions for all variable included in the analysis, while Table 2 presents the predicted and actual signs for all variables included in equations 5 and 6 above.

Table 1. The definitions for all variables included in the analysis

Variable	*Definition*
DA-Jones	Discretionary accruals that are calculated as the residual from using the corrected model of Jones (1991) as suggested by Dechow et al., (1995).
DA-Ball	Discretionary accruals that are calculated as the residual from using the Ball and Shivakumar (2008) model.
ABCF	Abnormal cash flows from operations that are calculated as the residual from using Roychowdhury (2006) model. To ease interpretation, the abnormal cash flows from operations are multiplied by minus one.
ABDX	Abnormal discretionary expenses that are calculated as the residual from using Roychowdhury (2006) model. To ease interpretation, the abnormal discretionary expenses are multiplied by minus one.
REM	The aggregated measure of real earnings management that is computed as the sum of abnormal cash flows from operations and abnormal discretionary expenses.
EXCOM	A proxy of executive compensation that is calculated as the sum of executives' salaries and any other compensations that are reported in the firms' annual reports.
BIG4	A dummy variable equals 1 if the audit firm is one of big 4 audit firms, and zero otherwise.
SIZE	The natural logarithm of total assets.
ROA	Return on assets calculated as net income divided by total assets.
LOSS	A dummy variable equals one if a firm reports loss and zero otherwise.
LEV	The leverage ratio that is calculated as total debt divided by total assets.
CPEX	Capital expenditures.
BV	Book value of equity.
BM	Book to market ratio that is calculated as book value of equity divided by market value of equity.

Note: This table presents the definitions for all variables included in the analysis.

Table 2. The predicted and actual signs of the all variables included in the analysis

Variables	*DA*		*REM*	
	Predicted sign	*Actual sign*	*Predicted sign*	*Actual sign*
EXCOM	+	+	+	-
BIG4	-	+	+	+
SIZE	+/-	-	+/-	+
ROA	+/-	+	+/-	-
LOSS	+/	-	+/-	+
LEV	+/-	+	+/-	+
CPEX	+/-	-	+/-	-
BV	+/-	+	+/-	-
BM	+/-	+	+/-	+

Note: This table presents the predicted and actual signs for all variables included in the regressions. Definitions of all variables are presented in Table 1.

4. FINDINGS

4.1. Descriptive statistics

Descriptive statistics for all variables included in this study are presented in Table 3. The median and mean values of accrual and real earnings management proxies are almost zero. This is due to the fact that these proxies represent the residuals from cross-sectional regressions and, therefore, their values are expected to be very small. Table 3 also presents statistics for executive compensation in Jordan and shows a range from JD 2569 to JD 26078675 with a mean (median) value of JD161505.2 (JD35000). In terms of audit quality, Table 3 shows that just 11 percent of the sample firms are audited by high-quality audit firms (*BIG4*). This is a very low percentage that would lead to lower financial reporting quality in the capital market. Public firms in Jordan may avoid hiring high-quality audit firms due to many reasons e.g., investors in Jordan do not consider appointing high-quality audit firms as a positive signal, public firms in Jordan avoid appointing high-quality audit firms due to the associated high costs, the lower quality governance system in Jordan does not encourage to appoint high-quality audit firms, etc. Further, Table 3 reports statistics for other determinant variables e.g., approximately 29 percent of the sample firms report losses; the leverage ratio is around seven percent which suggests that Jordanian public firms do not usually borrow money to finance their operations.

Table 3. Descriptive statistics for all variables included in the analysis.

	Mean	*Median*	*Standard. Deviation*	*Minimum*	*Maximum*
DA-Jones	0.003	0.000	0.083	-0.524	0.580
DA-Ball	0.001	-0.000	0.076	-0.413	0.580
ABCF	0.000	-0.000	0.142	-1.511	0.450
ABDX	-0.004	0.005	0.052	-0.422	0.125
REM	-0.004	0.002	0.155	-1.492	0.485
EXCOM	161505.2	35000.000	1380741	2569.000	26078675.000
BIG4	0.110	0.000	0.314	0.000	1.000
SIZE	16.693	16.3992	1.550	13.295	20.987
ROA	2.889	2.93	11.378	-50.930	51.090
LOSS	0.288	0.000	0.453	0.000	1.000
LEV	0.067	0.000	0.131	0.000	0.991
CPEX	1304580.775	75810.000	4203308.982	0.000	47101876.000
BV	15091665.762	2551941.000	42801527.285	0.000	426571000.000
BM	0.633	0.243	1.684	0.000	28.511
N	445				

Note: This table presents descriptive statistics for all variables included in the analysis of this study. Definitions of all variables are presented in Table 1.

The correlation matrix for main variables is presented in Table 4. As can be seen from Table 4 discretionary accruals (*DA-Jones*) are positively correlated with abnormal cash flows from operations and high-quality audit firms. This evidence suggests that accrual-based (discretionary accruals) and sales-based (abnormal cash flows from operations) are used as complementary techniques to manage reported earnings. For compensation Table 4 shows no evidence of the association between executive compensation and accrual and real earnings management. It is worth noting that correlation matrix provides just preliminary evidence and therefore the regressions will be used in the next sub-section to further examine these relationships.

Table 4. Correlations matrix

	DA-Jones	*DA-Ball*	*ABCF*	*ABDX*	*REM*	*EXCOM*	*BIG4*
DA-Jones	1						
DA-Ball	0.822***	1					
ABCF	0.113*	0.007	1				
ABDX	-0.050	-0.052	0.088	1			
REM	0.087	-0.011	0.942***	0.416***	1		
EXCOM	-0.002	0.001	-0.056	0.005	-0.049	1	
BIG4	0.121*	0.079	-0.026	-0.027	-0.033	0.069	1

*Note: This table reports Pearson correlation matrix for all variables. Significant at: *10, * *5 and * * *1 percent levels. Definitions of all variables are presented in Table 1.*

4.2. Empirical results

4.2.1. Executive compensation and accrual and real earnings management

Table 5 presents the results on the association between executive compensation and accrual and real earnings management in Jordan. Column 1 of Table 5 presents the results when the dependent variable is discretionary accruals (*DA-Jones*) that are estimated using the modified Jones (1991) model. Column 1 of Table 5 shows evidence that executive compensation is positively associated with accrual earnings management in Jordan. In particular, Column 1 of Table 5 reports a positive and statistically significant coefficient of 0.094 (P<0.05) on *EXCOM*. This evidence suggests that executive compensation is a significant driver to engage in accrual earnings management.

Column 2 of Table 5 presents the results when the dependent variable is discretionary accruals (*DA-Ball*) that are estimated using the Ball and Shivakumar (2008), model. Column 2 of Table 5 presents similar evidence that prove, managers in Jordan engage in a higher level of accrual earnings management to meet their compensation targets. In particular, column 2 of Table 5 reports a positive and statistically significant coefficient of 0.125 (P<0.01) on *EXCOM*. This evidence suggests that executive compensation is a significant incentive to engage in accrual earnings management. The results reported in columns 1 and 2 of Table 5 confirm the first hypothesis of this study that executive compensation in Jordan is positively associated with accrual earnings management. These results are also consistent with prior research that finds evidence on a positive association between executive compensation and accrual earnings management (Healy, 1985; Cheng and Warfield, 2005; Ronen et al., 2006).

Columns 3, 4, and 5 of Table 5 present the results on the association between executive compensation and real earnings management in Jordan. Column 3 of Table 5 presents the results when the dependent variable is abnormal cash flows from operations (*ABCF*) and shows evidence that executive compensation is negatively associated with sales-based manipulation. In particular, column 3 of Table 5 reports a negative and statistically significant coefficient of -0.111 (P<0.01) on *EXCOM*. This evidence suggests that a higher level of executive compensation is associated with a lower level of abnormal cash flows from operations. Column 4 of Table 5 in the meanwhile presents the results when the dependent variable is abnormal discretionary expenses (*ABDX*) and shows no evidence that executive compensation is associated with discretionary expenses-based manipulation.

Column 5 of Table 5 presents the results when the dependent variable is the aggregated measure of real earnings management (*REM*) and shows evidence that executive compensation is negatively associated with the aggregated measure of real earnings management. In particular, column 5 of Table 5 reports a negative and statistically significant coefficient of -0.064 (P<0.10) on *EXCOM*. This evidence suggests that a higher level of executive compensation is associated with a lower level of the aggregated measure of real earnings management. The results reported in columns 3 and 5 show evidence that executives who engaged in higher levels of abnormal cash flows from operation and the aggregated measure of real earnings management received a lower level of compensation. This evidence suggests that managers are punished by cutting their compensation when they manipulate reported earnings using real activities. Prior research shows evidence that real activities lead to severe negative consequences for firms' future performance (Cohen & Zarwoin, 2010; Alhadab et al., 2015) and, therefore, this may explain why managers are punished by receiving a lower level of compensation.

In summary, the results of Table 5 confirm the first hypothesis that executive compensation is positively associated with accrual earnings management. Further, Table 5 provides new evidence to the literature that managers of public firms in Jordan are punished by receiving a lower level of compensation when they engage in a higher level of real earnings management.

4.2.2. Audit quality and accrual and real earnings management

Columns 1 and 2 of Table 6 present the results of the association between audit quality and accrual earnings management in Jordan. Column 1 of Table 6 presents the results for discretionary accruals (*DA-Jones*) that are estimated using the modified Jones (1991) model. Column 1 of Table 6 shows no evidence that enhanced audit quality (*BIG4*) is associated with accrual earnings management in Jordan. In particular, column 1 of Table 6 reports a positive coefficient of 0.002 on *BIG4,* but statistically insignificant. Column 2 of Table 6 presents the results for discretionary accruals (*DA-Ball*) that are estimated using the Ball and Shivakumar (2008) model. Column 2 of Table 6 also shows no evidence that enhanced audit quality (*BIG4*) is associated with accrual earnings management in Jordan. In particular, column 2 of Table 6 reports a positive coefficient of 0.000 on *BIG4,* but statistically insignificant.

Thus, the reported results of columns 1 and 2 of Table 6 do not confirm the second hypothesis of this study that enhanced audit quality is associated with a lower level of accrual earnings management. This result may be attributed to the very low percentage of the total sample firms that are audited by high-quality auditors in Jordan. As can be seen from Table 3, just 11 percent of the total sample firms are audited by high-quality audit firms (*BIG4*) in Jordan.

Columns 3, 4, and 5 of Table 6 present the results of the association between audit quality and real earnings management in Jordan. Similar to discretionary accruals, Table 6 shows no evidence that enhanced audit quality is associated with real accrual earnings management. In particular, column 3 of Table 6 reports a positive and statistically insignificant coefficient of 0.054 on *BIG4* in abnormal cash flows from operation regression. Column 4 of Table 6 in the meanwhile reports a negative and statistically insignificant coefficient of -0.053 on *BIG4* in abnormal discretionary expenses regression. While column 5 of Table 6 reports the results for the aggregated measure of real earnings management and shows a positive and statistically insignificant coefficient of 0.020 on *BIG4* in the aggregated measure regression.

In summary, the results of Table 6 do not confirm the second hypothesis of this study that audit quality is associated with accrual and real earnings management. Prior research has found evidence that the presence of high-quality auditors leads to a lower (higher) level of accrual earnings management (real earnings management) (e.g., Cohen & Zarwoin, 2010; Chi et al., 2011; Zang, 2012). However, the current study finds no evidence of these relationships. This can be attributed to many factors e.g., prior studies are based on a developed context while the current study is based on a developing context (Jordanian sample); just 11 percent of the total sample firms are audited by high-quality audit firms.

Table 5. The association between executive compensation and accrual and real earnings management

	Column 1	***Column 2***	***Column 3***	***Column 4***	***Column 5***
VARIABLES	*DA-Jones*	*DA-Ball*	*ABCF*	*ABDX*	*REM*
Constant	1.139*** (4.335)	1.400*** (5.751)	0.118 (0.420)	0.083 (0.304)	0.031 (0.113)
EXCOM	0.094** (2.347)	0.125*** (3.202)	-0.111*** (-2.947)	0.063 (1.209)	-0.064* (-1.818)
SIZE	-0.031** (-1.980)	-0.045*** (-3.042)	0.029* (1.725)	0.032** (1.992)	0.033** (1.989)
ROA	0.010*** (5.728)	0.010*** (5.990)	-0.002 (-0.746)	-0.000 (-0.126)	-0.001 (-0.689)
LOSS	-0.161*** (-3.882)	-0.223*** (-5.985)	0.129*** (2.918)	0.009 (0.225)	0.120*** (2.826)
LEV	0.207* (1.769)	0.170 (1.516)	0.044 (0.327)	0.006 (0.063)	0.081 (0.615)
CPEX	-0.000 (-1.425)	-0.000 (-1.313)	-0.000 (-1.139)	-0.000 (-0.019)	-0.000 (-0.918)
BV	0.000*** (2.843)	0.000*** (2.906)	-0.000 (-1.269)	-0.000 (-0.913)	-0.000 (-1.168)
BM	0.007 (0.798)	0.004 (0.559)	0.011 (1.580)	0.008* (1.904)	0.010 (1.269)
Industry dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
N	445	445	445	445	445
R-squared	0.333	0.403	0.154	0.152	0.148
Adj. R-squared	0.274	0.351	0.080	0.077	0.073

*Note: This table presents the results of regression of executive compensation on accrual and real earnings management. ***, ** and *, indicate that estimates are significant at the 1%, 5%, and 10% levels, respectively. All models are controlled for industry and year effects. Definitions of all variables are presented in Table 1.*

Table 6. The association between audit quality and accrual and real earnings management

	Column 1	*Column 2*	*Column 3*	*Column 4*	*Column 5*
VARIABLES	*DA-Jones*	*DA-Ball*	*ABCF*	*ABDX*	*REM*
Constant	0.064 (1.217)	0.085* (1.911)	0.226 (0.794)	-0.011 (-0.042)	0.074 (0.260)
BIG4	0.002 (0.191)	0.000 (0.031)	0.054 (1.057)	-0.053 (-1.065)	0.020 (0.365)
SIZE	-0.001 (-0.482)	-0.003 (-0.995)	0.022 (1.291)	0.038** (2.356)	0.030* (1.760)
ROA	0.001 (0.723)	0.001 (0.546)	-0.001 (-0.725)	-0.000 (-0.164)	-0.001 (-0.689)
LOSS	0.028** (2.249)	0.021* (1.732)	0.132*** (2.999)	0.006 (0.139)	0.120*** (2.839)
LEV	-0.016 (-0.751)	-0.030** (-1.989)	0.050 (0.375)	0.002 (0.017)	0.084 (0.639)
CPEX	-0.000 (-1.492)	-0.000 (-0.802)	-0.000 (-1.264)	0.000 (0.046)	-0.000 (-1.011)
BV	0.000 (0.226)	0.000 (0.288)	-0.000 (-1.348)	-0.000 (-0.803)	-0.000 (-1.180)
BM	-0.001 (-1.222)	-0.001 (-1.631)	0.011 (1.470)	0.008* (1.869)	0.010 (1.226)
Industry dummies	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes
N	445	445	445	445	445
R-squared	0.156	0.171	0.156	0.153	0.148
Adj. R-squared	0.081	0.097	0.081	0.078	0.073

*Note: This table presents the results of regression of audit quality on accrual and real earnings management. ***, ** and *, indicate that estimates are significant at the 1%, 5%, and 10% levels, respectively. All models are controlled for industry and year effects. Definitions of all variables are presented in Table 1.*

5. CONCLUSIONS

This study investigates whether executive compensation and audit quality are associated with accrual and real earnings management in Jordan. Using a sample of 445 firm-year observations over the period from 2000 to 2011, this study contributes to the literature by the following. First, this study provides the first evidence to the literature on the association between executive compensation and accrual and real earnings management based on a Jordanian sample. Prior research has mostly focused on developed countries such as UK and US. In particular, the findings of this study show that executive compensation is positively associated with accrual earnings management, suggesting that managers manipulate reported earnings via discretionary accruals to meet their compensation targets. Second, this study also reports the first evidence on the association between executive compensation and real earnings management in Jordan. In particular, the findings of this study show that managers receive a lower level of compensation when they engage in a higher level of abnormal cash flows from operations and the aggregated measure of real earnings management. Thus, it seems that managers in Jordan are punished by reducing their compensation when they engage in a higher level of real earnings management. Prior research shows evidence that real earnings management are negatively associated with subsequent operating and stock return performance (Cohen & Zarwoin, 2010), and even real activities may lead to corporate failure (Alhadab et al., 2015).

Finally, this study contributes to the literature by examining whether audit quality is associated with accrual and real earnings management. Prior research shows that enhanced audit quality leads to a lower level of accrual earnings management, but at the expense of more real earnings management. However, the findings of this study show no evidence that audit quality is associated with accrual and real earnings management in Jordan. As explained before, this result may due to the fact that just 11 percent of the total sample firms are audited by high-quality audit firms. It seems that the majority of Jordanian public firms do not prefer to appoint high-quality audit firms as compared to other public firms listed on developed stock exchanges.

The main findings of this study can provide several implications to many interested parties in Jordan. The related authorities in Jordan e.g. the Securities Exchange Commission should address the reasons that led to this very lower percentage (11%) of Jordanian public firms that are audited by high-quality auditors. Hiring high-quality audit firms is used to be considered globally as a positive signal by the capital market participants (Brau and Fawcett, 2006). Unfortunately, in Jordan, there are some reasons that prevent public firms from appointing high-quality auditors e.g., costs. Further, the structure of executive compensation should be revised in Jordan to ensure it aligns with the interest of executives and shareholders. The current structure of executive compensation in Jordan has led managers to engage in a higher level of accrual earnings management to meet the compensation targets. Public firms in Jordan in the meanwhile are found to engage in higher levels of accrual and real earnings management to manipulate reported earnings and, therefore, the regulatory environments in Jordan should be reformed to prevent such earnings management practices.

Future research can extend the current study and building on its findings to explore further whether the executive compensation and audit quality impacts managers' tendency to choose between real and accrual earnings management. For example, the prior literature indicates that managers engage in a higher level of real earnings management to avoid the monitoring of audit firms on the use of accrual earnings management.

In term of the study limitations, the measurement of earnings management techniques is still a big concern not just to this study, but to all accounting and finance research.

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